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Call for Papers

Special Issue on Linear and Nonlinear Models and Algorithms in Intensity-Modulated Radiation Therapy (IMRT)

Linear Algebra and its Applications (LAA) is pleased to announce a special issue on "Linear and Nonlinear Models and Algorithms in Intensity-Modulated Radiation Therapy (IMRT)".

IMRT is revolutionizing radiation therapy by putting at the disposal of the medical profession powerful tools to deliver higher radiation doses to tumors and lower radiation doses to critical organs in more accurate ways.

The scientific effort is a multidisciplinary one in which radiation oncologists, other medical specialists, medical physicists, mathematicians, computer scientists and engineers collaborate to study many outstanding problems in treatment planning and delivery. The goal is to merge this expertise and discover IMRT solutions that can produce meaningful benefits to patients and consistent results to practitioners.

In view of the ever-increasing role of mathematics, particularly linear algebra, optimization theory, operations research, and other applied branches in IMRT, we look forward to first-class original research submissions on all relevant aspects of IMRT, including image-guided radiation therapy (IGRT) which uses online imaging capabilities to reduce uncertainties in organ localization and allows response to changes in treatment geometry over time.

We welcome papers for the special issue within the entire scope of IMRT; topics of interest include, but are not limited to:

- Algorithm engineering
- Aperture weight optimization
- Automated structure delineation
- Column-generation methods for large problem formulations
- Dose-volume constraints handling
- Gantry angle optimization
- Image-guided radiation therapy (IGRT)
- Large-scale matrix reduction and sparsing techniques
- Mathematical programming and operations research methods in IMRT
- Optimization of the segmentation process

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- Rigid and deformable registration
- Sensitivity analysis for revised constraints or changed geometry
- Sampling techniques over constrained volumes
- Variance at risk methods for dose-volume modeling

The deadline for submission of papers is July 31, 2006. Papers should be sent to any one of the four special editors, listed below, preferably PDF files as attachments to e-mail, and will be subject to normal refereeing procedures according to LAA standards. Go to: http://authors.elsevier.com/JournalDetail.html?PubID=522483&Precis=&popup= and click on: "Guide for Authors" (but do not use the online submission for this special issue).

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The editor-in-chief responsible for this special issue is Hans Schneider.